invention has been described in particular embodiments, it should be appreciated that the present invention should not be construed as limited by such embodiments, but rather construed according to the below claims.

What is claimed is:

1. A rectifier device comprising:

a substrate of a first polarity;

a lightly doped layer of said first polarity coupled to the first surface of said substrate;

a metallization layer disposed on said lightly doped layer as an anode of the rectifier device;

a metal contact disposed on the substrate as a cathode of the rectifier device;

a plurality of trenches recessed vertically into said lightly doped layer, wherein each of said plurality of trenches is filled with a conductive material;

a plurality of wells, separated from one another, formed beneath and adjacent to said plurality of trenches, comprising doping of a second polarity, wherein said plurality of wells are electrically coupled to said metallization layer via said conductive material in said plurality of trenches; and

a plurality of JFET channel regions, separated from said metallization layer by at least a portion of said lightly doped layer and located between wells of said plurality of wells, more highly doped of said first polarity than said lightly doped layer, wherein the plurality of JFET channel regions have approximately the same vertical dimension as the plurality of wells and the plurality of JFET channel regions are configured to form a plurality of vertical current flow channels between the metallization layer and the substrate.

2. The rectifier device of claim **1** further comprising a layer of oxide forming oxide sidewalls on each of said plurality of trenches.

3. The rectifier device of claim **1** wherein said first polarity is negative (n type).

4. The rectifier device of claim **1** wherein said lightly doped layer is an epitaxial layer.

5. The rectifier device of claim **1** wherein a pitch between said plurality of trenches is less than about 1.0 microns.

6. The rectifier device of claim **1** wherein a depth of said plurality of trenches is less than about 0.9 microns.

7. The rectifier device of claim **1** wherein said metallization layer comprises aluminum.

8. The rectifier device of claim **7** wherein said metallization layer comprises silicon.

9. The rectifier device of claim **1** further comprising a Schottky barrier between said metallization layer and said lightly doped layer.

10. The rectifier device of claim **9** further comprising a PiN area and wherein a ratio of area of said Schottky barrier to said PiN area is greater than 1.0.

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